JOHANNA JENSEN, PH.D.

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SUMMARY:

Forest Ecologist with 6+ years of experience in evaluating impacts of climate change on forest communities. Experienced using quantitative statistics to assess forest carbon, resiliency, and regrowth in a changing climate. Passionate about implementing ecological data and theory to make a positive, impactful change that promotes the health of people and the planet.

EDUCATION

Ph.D. Candidate in Ecology, Columbia University, New York, NY   Feb 2023
      Ecology, Evolution, and Environmental Biology (E3B)
      Advisors: Drs. Kevin Griffin & Natalie Boelman
      Dissertation Title: "Environmental controls of growth and regeneration at the Arctic treeline in a changing climate."
      Funded by & in collaboration with:
            NASA's Arctic-Boreal Vulnerability Experiment (ABoVE) (link)
            Grant Award #: NNX15AT86A

M.Phil. in Ecology, Columbia University, New York, NY   2019

M.A. in Ecology, Columbia University, New York, NY   2018

B.A. in Environmental Science, Colorado College, Colorado Spring, CO   2014
      Cum Laude, GPA 3.8
      Graduation with Distinction in the Environmental Science Program

AWARDS & GRANTS

2021   Lamont-Doherty Earth Observatory Climate Center, Columbia University ($10,000). Temporal dynamics of tree-growth and photosynthesis and their environmental drivers in the Lamont Sanctuary Forest Preserve. Rao, M.P., Pacheco-Solana, A., **Jensen, J.,** Oryan, B., Rodríguez-Catón, M., Griffin, K.L., Andreu-Hayles, L., Boelman, N., Commane, R., Gentine, P., & Davi, N.K.

2018   NSF Graduate Research Fellowship Honorable Mention

2017   Theodore Gordon Flyfishers Foundation Fund Grant Recipient ($3,500)

2016   Dean's Fellow, Graduate School of Arts and Sciences, Columbia University ($158,000)

2014   Outstanding Senior Academic Award in Environmental Science, Colorado College($100)
        Roz Naylor Conference Grant, Environmental Science Dept, Colorado College ($500)

PUBLICATIONS

In Review

      J.E. Jensen, N. Boelman, J. Eitel, L. Vierling, A. Maguire, R. Oelkers, C.Silva, L. Andreu-Hayes, R. D'Arrigo, K.L. Griffin. *In review*. Growth increases but regeneration

declines in response to warming and drying at Arctic treeline in white spruce (Picea glauca). *Environmental Research Letters*.

J.E. Jensen, Eitel, J., A.J. Maguire, K. Griffin, N. Boelman, S.C. Schmiege, and L. Vierling. *In review*. ABoVE: High-precision point dendrometer and weather observations at Arctic treeline, AK. ORNL DAAC, Oak Ridge, Tennessee, USA.

J.E. Jensen, Eitel, J., A.J. Maguire, K. Griffin, N. Boelman, **J.E. Jensen**, S.C. Schmiege, and L. Vierling. *In review*. ABoVE: Tree age-height, aerial lidar tree detection at Arctic treeline, AK. ORNL DAAC, Oak Ridge, Tennessee, USA.

2023   **J.E. Jensen**, N. Boelman, J. Eitel, L. Vierling, A. Maguire, R. Oelkers, C.Silva, L. Andreu-Hayes, R. D'Arrigo, K.L. Griffin. 2023. Growth increases but regeneration declines in response to warming and drying at Arctic treeline in white spruce (Picea glauca). BioRxiv. Preprint. https://doi.org/10.1101/2023.01.12.523811

2022   Schmiege, S. C., K. L. Griffin, N. T. Boelman, L. A. Vierling, S. G. Bruner, E. Min, A. J. Maguire**, J.E. Jensen**, and J. U. H. Eitel. 2022. Vertical gradients in photosynthetic physiology diverge at the latitudinal range extremes of white spruce. Plant Cell and Environment:45–63.

2020   Eitel, J., A.J. Maguire, K. Griffin, N. Boelman, **J.E. Jensen**, S.C. Schmiege, and L. Vierling. 2020. ABoVE: Photochemical Reflectance and Tree Growth, Brooks Range, Alaska, 2018-2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1781

Maguire, A.J., J. Eitel, L. Vierling, N. Boelman, K. Griffin, J.S. Jennewein, and **J.E. Jensen**. 2020. ABoVE: Terrestrial Lidar Scanning Forest-Tundra Ecotone, Brooks Range, Alaska, 2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1782

Eitel, J. U. H., K. L. Griffin, N. T. Boelman, A. J. Maguire, A. J. H. Meddens, **J. Jensen**, L. A. Vierling, S. C. Schmiege, and J. S. Jennewein. 2020. Remote sensing tracks daily radial wood growth of evergreen needleleaf trees. Global Change Biology:0–3.

Eitel, J.U.H., K.L. Griffin, N.T. Boelman, L.A. Vierling, J. Jensen, A.J. Maguire, and S.C. Schmiege. 2020. In-situ Photochemical Reflectance Index and Tree Growth in Northern Alaska, 2018-2019. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1781

2019   Eitel, J., A. Maguire, N. Boelman, L. Vierling, K. Griffin, **J. Jensen**, T. Magney, P. Mahoney, A. Meddens, C. Silva, and O. Sonnentag. 2019. Remotely sensing tree physiology at northern treeline: Do late-season changes in the photochemical reflectance index (PRI) respond to climate or photoperiod? Remote Sensing of Environment.

Maguire, A. J., J. Eitel, L. A. Vierling, D. M. Johnson, K. L. Griffin, N. K. Boelman, **J. E. Jensen**, H. E. Greaves, and A. Meddens. 2019. Terrestrial lidar scanning reveals fine-scale linkages between microstructure and photosynthetic functioning of small-stature spruce trees at the forest-tundra ecotone. Agricultural and Forest Meteorology.

PRESENTATIONS, POSTERS & MEDIA
*presenter

2022   *When do oak trees grow?* *Rao, M.P., Racheco-Solana A., Griffin K.L., **Jensen, J.E.,** Pederson N., Oryan B., Nixon T., Rodríguez-Catón M, Andreu-Hayles L., Hise J., Peñuelas J., Magney T. et al. Poster Presentation, AGU, Chicago, December 2022.

2020   *Determining the suitability of remotely sensed snow disappearance date as a proxy for the onset of stem radial growth in conifers at the forest-tundra ecotone.* *Weygint, W., Eitel, J.U.H., Boelman, N., **Jensen, J.E.,** Griffin, K.L., Maguire, A., Vierling, L.A. Poster Presentation, AGU, Virtual Meeting, December 2020.

        The influence of environmental variables on intra-seasonal radial stem growth dynamics at the Arctic forest-tundra ecotone using point dendrometers. ***Jensen, J.E**., Griffin, K.L., Eitel, J.U.H., Boelman, N., Vierling, L.A., Maguire, A. Oral Presentation, AGU, Virtual Meeting, December 2020.

2019   *Remote sensing of intra-annual tree growth dynamics in a boreal forest.* *Eitel, J.U.H., Griffin, K.L., Boelman, N., Meddens, A.J., **Jensen, J.,** Vierling, L.A., Maguire, A., Schmiege, S.C. and Jennewein, J.S., 2019, December. Presentation, AGU, Virtual Meeting, December 2019.

2018   *Using aerial lidar to understand the role of climate and herbivory in shaping forest demographics at the Arctic forest-tundra ecotone.* ***Jensen, J. E.,** A. Maguire, R. Oelkers, L. Andreu, N. Boelman, R. D'Arrigo, K. Griffin, C. Silva, J. Jennewein, A.J.H. Meddens, M. Russell, L. A. Vierling, and J.U.H. Eitel. Presentation, AGU, Washington D.C., December 2018.

        Using aerial lidar to understand the role of climate and herbivory in shaping forest demographics at the Arctic forest-tundra ecotone . ***Jensen, J. E.,** A. Maguire, R. Oelkers, L. Andreu, N. Boelman, R. D'Arrigo, K. Griffin, C. Silva, J. Jennewein, A.J.H. Meddens, M. Russell, L. A. Vierling, and J.U.H. Eitel. E3B Student Seminar Series, New York, NY, September 2018.

        Towards lidar-based mapping of tree age at the Forest Tundra Ecotone. ***Jensen, J. E.,** A. Maguire, R. Oelkers, L. Andreu, N. Boelman, R. D'Arrigo, K. Griffin, C. Silva, J. Jennewein, A.J.H. Meddens, M. Russell, L. A. Vierling, and J.U.H. Eitel. Poster Presentation, NASA Arctic Boreal Vulnerability Experiment (ABoVE) Annual Conference. Seattle, WA, January 2018.

Terrestrial Lidar and Chlorophyll Fluorescence Reveal Structure-to-Function Relationships of Spruce Saplings at the Forest-Tundra Ecotone. *Maguire, A.J., J.U.H. Eitel, L.A. Vierling, D.M. Johnson, K.L. Griffin, N.T. Boelman, **J.E. Jensen**, A.J.H. Meddens. Poster Presentation, NASA Arctic Boreal Vulnerability Experiment (ABoVE) Annual Conference. Seattle, WA, January 2018.

2017   *Using Terrestrial Lidar to Elucidate Structure-to-Function Relationships of Spruce Saplings at the Forest-Tundra Ecotone.* *Maguire, A.J., J.U.H. Eitel, L.A. Vierling, D.M. Johnson, K.L. Griffin, N.T. Boelman, **J.E. Jensen,** E. Hiers. Poster Presentation, AGU, New Orleans, December 2017.

Towards lidar-based mapping of tree age at the Forest Tundra Ecotone. ***Jensen, J. E.,** A. Maguire, R. Oelkers, L. Andreu, N. Boelman, R. D'Arrigo, K. Griffin, J. Jennewein, A.J.H. Meddens, M. Russell, L. A. Vierling, and J.U.H. Eitel. Poster Presentation, AGU, New Orleans, December 2017.

Predicting tree demography from lidar-derived tree height. * **Jensen, J. E.,** Boelman, N. T., Griffin, K. G., Eitel, J. U. H., Vierling, L. A., Oelkers, R., Maguire, A. J., Jennewein, J., D'Arrigo, R., Andreu, L., Meddens, A., Russell, M. E3B Student Seminar Series, New York, NY, October 2017.

Characterizing the structural growth environment of successfully established spruce seedlings at northern treeline using lidar remote sensing. *Maguire, A.J., N.T. Boelman, K.L. Griffin, **J.E. Jensen**, D.M. Johnson, L.A. Vierling, J.U.H. Eitel. Poster Presentation, ESA. Portland, OR. August 2017.

Chasing Treeline: Reconstructing the history of the Forest-Tundra Ecotone from lidar-derived tree height. * **Jensen, J. E.,** Boelman, N. T., Griffin, K. G., Eitel, J. U. H., Vierling, L. A., Oelkers, R., Maguire, A. J., Jennewein, J., D'Arrigo, R., Andreu, L., Meddens, A., Russell, M. E3B Student Seminar Series, New York, NY, March 2017.

Chasing Treeline: Reconstructing the history of the Forest-Tundra Ecotone from lidar-derived tree height. **Jensen, J. E.,** *Boelman, N. T., Griffin, K. G., Eitel, J. U. H., Vierling, L. A., Oelkers, R., Maguire, A. J., Jennewein, J., D'Arrigo, R., Andreu, L., Meddens, A., Russell, M. Poster Presentation, NASA Arctic Boreal Vulnerability Experiment (ABoVE) Annual Conference. Boulder, CO. January 2017.

LiDAR, passive spectral, and ecophysiological approaches to link Forest Tundra Ecotone structure and function. *Eitel, J. U. H., Boelman, N. T., Griffin, K. L., Vierling, L. A., **Jensen, J. E.,** Maguire, A. J., Jennewein, J., Meddens, A., Russell, M. Poster Presentation, NASA Arctic Boreal Vulnerability Experiment (ABoVE) Annual Conference. Boulder, CO. January 2017.

2014   *Ecological regular pattern formation of Alpine Avens* (Geum rossii) *and the Northern Pocket Gopher* (Thomomys talpoides) *disturbance on Pikes Peak, Colorado.* ***Jensen, J.

E., M. Kummel, and L. E. Herbert. Poster Presentation, ESA. Sacramento, CA. August 2014.

TEACHING EXPERIENCE

Teaching Assistant, *Forest Ecology,* Columbia University   Fall 2018
This course focused on identifying, interpreting, and understanding patterns and processes common in forested ecosystems. Students learned via lecture, literature discussion, weekly field trips, and analysis and interpretation of student-collected data.
- Coordinated weekly, full-day field trips including student transportation through NYC & tri-state area
- Created assignment to teach dendroclimatology and the effect of climate on forest growth
- Developed and led a workshop to aid students with data analysis and interpretation in Excel
- Taught students field data collection techniques and data management skills

Teaching Assistant, *Fundamentals of Ecology,* Columbia University   Spring 2018
This course explored the foundational topics, developments, and history of several branches of ecology, including population, community, and ecosystems ecology.
- Led 13+ small group discussions related to classic ecological papers
- Created and led review sessions and regularly assisted students with coursework and grading.

Teaching Assistant, *Intro to Statistics for Ecology & Evolution,* Columbia University   Fall 2017
An introduction to common statistical methods in ecology and evolutionary biology. Course taught ~60 undergraduate-level and graduate-level students.
- Taught statistical techniques using R Statistical Software during 14 lab sessions
- Graded one-third of all assignments and the final exam

PROFESSIONAL DEVELOPMENT
Pedagogical Training:
    Innovative Teaching Summer Institute, Columbia University (June 2019)

Data Analysis Training:
Participant:
    Introduction to Python, Columbia University (Aug 2019)
    Data Manipulation using 'tidyverse' in R, E3B, Columbia University (May 2018)
    Data Visualization using 'ggplot2' in R, ESA Conference, Portland, OR (Aug 2017)
    Accessing NEON's API in R, ESA Conference, Portland, OR (Aug 2017)

Facilitator:
I created and taught the following two-hour workshops for the graduate students in E3B:
    Data Visualization using 'ggplot2' in R (Aug 2018, May 2019)
    Data Manipulation using 'tidyverse' in R (Feb 2019)

RESEARCH APPOINTMENTS

Ph.D. Researcher   2016 – 2022
Ecology, Evolution. & Env. Biology Dept., Columbia University, New York, NY

This position and my dissertation is funded by a NASA Arctic-Boreal Vulnerability Experiment (ABoVE) grant entitled "LiDAR, passive spectral, and ecophysiological approaches to link Forest Tundra Ecotone structure and function" led by Dr. Jan Eitel (University of Idaho) (Link to website).

Lead Seasonal Field Technician, Aquatic Ecology   March 2016 – July 2016
National Ecological Observatory Network (NEON), Boulder, CO
NEON's mission is to "enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology" (neoninc.org). They accomplish this by providing infrastructure and consistent methodologies at 106 terrestrial and aquatic sites. Paid position.
- Led and taught seasonal field technicians in aquatic protocols for field and laboratory components
- Measured water quality metrics including discharge, pH, temperature, stable isotopes, and dissolved gases
- Quantified fish abundance and diversity using an electro-fishing in a small ground-fed stream

Seasonal Field Technician, Botany & Plant Diversity   May 2015 – Oct 2015
National Ecological Observatory Network (NEON), Boulder, CO
Researched plant diversity with a small team of technicians at two NEON Observatories: Niwot Ridge and Central Plains Experimental Range. Paid position.
- Quantified plant diversity, vegetation structure, plant biomass, and phenology
- Assisted field protocols on tick abundance, LAI, ground beetle analysis, and small mammal trapping

Behavioral Ecology Intern   Sept 2014 – Nov 2014
The Bottlenose Dolphin Research Institute (BDRI), O Grove, Galicia, Spain
Worked under head researcher Bruno Diaz Lopez, Ph.D., to investigate questions surrounding the influence of human activities and the behavioral flexibility of bottlenose dolphins. Fulltime volunteer position.
- Observed behavior, counted individuals, and transcribed behavioral data on-board the research vessel.
- Matched photo identified individuals to catalog using DARWIN Software
- Collected 20-minute environmental surveys during field work, including Douglas Sea Scale, wind speed, bird species, number and type of boats in the area, water pH, conductivity, and GPS position

Research Fellow, Environmental Science Department   June 2013 – Sept 2013
Colorado College, Colorado Springs, CO
Independent research on biogeochemistry and spatial ecology of alpine tundra, entitled: "Pikes Peak Freckles: Spatial Pattern Formation of Alpine Tundra On Pikes Peak, CO."
- Designed and conducted a comprehensive observational study exploring population and ecosystem ecology of a unique regular spatial pattern formation of an alpine buttercup (*Geum rossii*)
- Evaluated physical and chemical parameters of soil, microtopography, and vegetation composition
- Determined concentrations of P and N in soil using KCl extraction methods, ion chromatography (Dionex Ion Chromatograph System 5000), and bulk density measurements

Research Intern, Earth Systems Research Laboratory   June – Aug 2011 & May – Aug 2012
National Oceanic and Atmospheric Administration, Boulder, CO
Conducted two consecutive, paid summer internships at NOAA's Earth Systems Research Laboratory Global Monitoring Division. Quality-checked and organized 76 years of meteorological data collected from seven worldwide sites. This data was published to the NOAA website (Link).

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FIELD RESEARCH LOCATIONS

Toolik Field Station, Alaska, USA	Sep 2017, Sep 2019
Aurora Research Institute, Inuvik, NT, Canada	Jul 2017
Wiseman, AK, USA	Jun 2016

National Ecological Observatory Network Field Sites in Colorado, USA:

Como Creek	Mar – July 2016
Arikaree River	Mar – July 2016
West St. Louis Creek	Mar – July 2016
Central Plains Experimental Range	May – Oct 2015
North Sterling	May – Oct 2015
Niwot Ridge LTER Station	May – Oct 2015
O Grove, Galicia, Spain	Aug – Nov 2014
Marine Biological Laboratory, Woods Hole, MA	Aug – Dec 2013
Pikes Peak, Colorado Springs, CO, USA	June – Aug 2013

OUTREACH & SERVICE

Outreach Outside Columbia Committee, Founding Member, Columbia	Jun 2020 – 2022
Outreach Within Columbia Committee, Founding Member, Columbia	Jun 2020 – 2022
Girls' Science Day Volunteer, Columbia University	2016 – 2019
Environmental Program Student Committee, Director, Colorado College	2014

SKILLS:

Certifications
CPR & First Aid Certified (Expires June 2021)

Languages
French (conversant)

Statistics and Data Science:

- R Statistical Software
- Beginners understanding of Python
- Data visualization and manipulation
- Tidyverse R packages
- Database development
- Remote Sensing: QGIS, ArcGIS, R geostatistics
- Bayesian hierarchical modeling

Other:

- Systematic review of literature
- Forestry & forest inventory
- Project management
- Sampling design
- Critical thinking
- Problem solving
- Effective communicator
- Collaboration
- Outreach